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13. ABSTRACT (Maximum 200 words)

Professor Pless has made fundamental contributions to the theory of Reed-Muller codes. In particular, she has enumerated the binary self-dual Reed-Muller codes.

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Vera Pless

I. The following papers acknowledge Air Force support

1. (with R. Brualdi), Subcodes of Hamming codes, *Congressus Numerantium* **70** (1990), 153–158.

2. (with R. Brualdi), Orphans of the first order Reed-Muller codes, *IEEE Trans. Inform. Theory*, **IT-36** (1990), 399–401.

3. (with C. Lam), There is no (24, 12, 10) extremal quaternary code, *IEEE Trans. Inform. Theory*, **IT-36** (1990), 1153–1156.

4. Games and Codes, Proceedings of Symposia in Applied Mathematics, **43** (1991), 101–110.

5. (with R. Brualdi), Weight Enumerators of Self-Dual Codes, *IEEE Trans. Inform. Theory*, **IT-37** (1991), 1222–1224.

6. Codes and designs, existence and uniqueness, *Discrete Math.*, to appear.

7. (with R. Brualdi and N. Cai), Orphan structure of the first order Reed-Muller codes, *Discrete Math.*, to appear.

8. (with J. H. Conway and N.J.A. Sloane), The binary self-dual codes of length up to 32: A revised enumeration, *JCT (A)*, to appear.

II. Invited talks

1. "Introduction to Error Correcting Codes and a New Decoding Scheme," Northern Illinois evening talk for graduate students and faculty, Dekalb, IL, October 17, 1988.

2. "Decoding the Golay Code," Math. Colloquium, Northern Illinois University, Dekalb, IL, October 28, 1988.

3. "On the Covering Radius of Codes," Combinatorics Seminar, University of Wisconsin-Madison, WI, November 18, 1988.

4. "Codes and Designs," Mathematics Colloquium, Technion, Haifa, Israel, March 6, 1989.

5. "On the Covering Radius of Codes," Discrete Math. Group Seminar, Weizmann Institute of Science, Rehovot, Israel, March 29, 1989.

6. "Orphans of the First-Order Reed-Muller Codes," Bellcore Seminar, Bellcore, Morristown, N.J., December 4, 1989.

7. "Orphans of the First-Order Reed-Muller Codes," International Conference on Application of Algebraic Geometry, University of Puerto Rico, Rio Piedras, Puerto Rico, January 11, 1990.

8. "Orphans of the First-Order Reed-Muller Codes," IEEE International Symposium on Information Theory, San Diego, Calif., January 18, 1990.

9. "Extremal Codes and Homogeneous," IEEE International Symposium on Information Theory, San Diego, Calif., January 19, 1990.

10. "There is no Quaternary (24, 12, 10) Extremal Code," IEEE International Symposium on Information Theory, San Diego, Calif., January 19, 1990.

11. "Extremal Self-Dual Codes" and " Orphans of First-Order Reed-Muller Codes," 3rd Auburn Combinatorics Conference, Auburn University, Auburn, Alabama, March 22, 1990.

12. "Orphans of the First-Order Reed-Muller Codes," Designs and Codes, Oberwolfach, Germany, April 14, 1990.

13. "Extremal Self-Dual Codes," Sixth Haifa Matrix Theory Conference, Technion, Haifa, Israel, June 12, 1990.

14. "On Self-Dual Codes," Mathematics Colloquium, Hebrew University, Jerusalem, Israel, June 7, 1990 and Weizmann Institute, Rehovot, Israel, June 18, 1990.

15. "On Games and Codes," A.M.S. short course, Ohio State University, Columbus, Ohio, August 7, 1990.

III. Other Activities

1. On National Research Council Committee to advise N.S.A. about Ocrea grants.

2. Editor: *Journal of Combin. Theory (A)*
          Algebras, Groups and Geometries

   Associate Editor: *Linear Algebra and Its Applications*

IV. Graduate Students

My student, Venessa Job, received her Ph.D. in 1989; "On Polyadic Codes". She is presently a Clare Booth Luce professor at Marymount University in Arlington, VA.

My student, Xiang-Dong Hou received his Ph.D. in 1990; "On the Covering Radius of Codes". He is presently an assistant professor at Wright State University in Dayton, Ohio.

I supervised Ning Cai – a postdoctoral mathematician in 1989.

During this period I supervised Jesse Nemoyer and Laura Monroe who are working on their theses.